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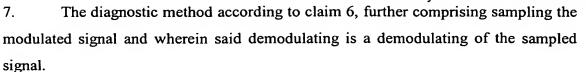
Attorney Docket No.: 11037-003-999

WHAT IS CLAIMED IS:

- 1. A gear state diagnostic method using frequency demodulation comprising:
- (a) detecting a voltage value that is linked to changes in rotational speed of a gear, the voltage value being output by a pulse generator;
- (b) performing frequency modulation of the voltage value by monitoring means;
- (c) acquiring the rotational speed of the gear by performing frequency demodulation of the frequency modulated voltage value; and
- (d) monitoring the demodulated frequency and tracking changes in rotation of the gear to determine whether there are errors in the gear.
- 2. The method of claim 1 wherein in step (a), the voltage value being output by the pulse generator is expressed as a square wave.
- 3. The method of claim 1 wherein in step (a), the voltage value being output by the pulse generator is expressed as a sawtooth wave.
 - 4. The method of claim 1 wherein in step (d), it is determined that there are errors in the gear if a trace of changes in rotation of the gear is non-uniform.
 - 5. The method of claim 1, wherein said step (c) employs a sampling method.
- 6. A gear state diagnostic method, comprising: generating a signal corresponding to a rotational gear speed; modulating said signal; demodulating said signal to acquire the gear rotational speed; monitoring the demodulated signal; tracking changes in gear rotation based on said monitored signal; and determining whether errors are present in the gear based on said tracked changes.

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- 5 8. The diagnostic method according to claim 6, wherein said determining step comprises determining whether the changes in gear rotation are non-uniform.
 - 9. The diagnostic method according to claim 6, wherein said signal is a voltage value corresponding to rotational gear speed.
 - 10. The diagnostic method according to claim 9, wherein said voltage value is generated by a pulse generator.
 - 11. The diagnostic method according to claim 9, wherein said modulating step is a frequency modulation and said demodulating step is a frequency demodulation.